

THE INSTRUCTIONAL STAFF

(Each presentation will be conducted by one of the following seminar leaders.)

ROBERT M. WAINWRIGHT is President of R. M. Wainwright and Associates, Inc., a data communications management consulting firm. Mr. Wainwright is an expert in the planning, design, implementation and support of data communications systems. His background includes various management and technical positions with Microdata Corp., Control Data Corp., and Western Union Telegraph Company. He has written, lectured and consulted extensively for many organizations in the United States and abroad. Mr. Wainwright formulated, designed, and developed the data communications curriculum for The Institute for Advanced Technology and has presented seminars for The Institute since 1969.

BILLY K. GEURIN is a Senior Member of R. M. Wainwright and Associates, Inc. Mr. Geurin was formerly with the Western Union Telegraph Co. where he served as System Maintenance Supervisor of the General Services Administration Advanced Record System (ARS), and participated in advanced systems planning to modernize the United States TELEX and TWX systems. Mr. Geurin is an expert in circuit switching, store-and-forward, front end, data concentrator, and a wide variety of multiplexing and hubbing transmission systems. Mr. Geurin is an officer and member of the Independent Telephone Pioneers Association and IEEE. He has presented numerous data communications seminars in the United States and abroad for The Institute for Advanced Technology.

TUITION

Tuition, including course materials and luncheons, is \$395 for the first participant and \$370 for all additional persons from the same organization attending the same presentation. Effective January 1, 1976, the cost of tuition for this seminar will be \$485 for the first participant. If a check is received in advance of the opening date of the seminar, a \$25 discount will be allowed for other participants from the same organization attending the same presentation. Checks should be made payable to The Institute for Science and Public Affairs.

Classes begin at 9:00 a.m. and end at 5:00 p.m.

CANCELLATION:

For all cancellations received less than two weeks before scheduled presentation there is a \$50.00 cancellation fee.

DATES AND LOCATIONS

Seminars are conducted at the hotels listed below. The cost of hotel rooms is not included in the tuition. IAT does not arrange hotel reservations; however, the hotels will hold a block of rooms for seminar participants until two weeks before the seminar. Hotel reservation cards will be forwarded with registration confirmations.

Please contact the hotels directly for reservations; mentioning IAT; ISPA; the seminar; and dates attending.

December 3-5, 1975
Holiday Inn-Union Square
480 Sutter Street
San Francisco, California 94108
Room Reservations: 415/398-8900

January 14-16, 1976
Sheraton National Motor Hotel
Columbia Pike and Washington Boulevard
Arlington, Virginia 22204
Room Reservations: 703/521-1900

February 25-27, 1976
New York Sheraton
870 Seventh Avenue
New York, New York 10019
Room Reservations: 212/247-8000

March 17-19, 1976
Key Bridge Marriott Motor Hotel
U.S. 29 and 211
Washington, D.C. 20007
Room Reservations: 703/524-6400

THE INSTITUTE FOR SCIENCE AND PUBLIC AFFAIRS

The Institute is an independent nonprofit organization specializing in innovative programs for dissemination of new technology and emphasizing its applications to real user problems in the public and private sectors.

The Institute does not discriminate against anyone. Scholarships are available to physically handicapped professionals. Application should be made to Director, The Institute for Science and Public Affairs.

REGISTRATION

TO REGISTER, for further information, or to be placed on the mailing list, please call 301/770-8576 (after Nov. 7, 301/468-8576), or write The Institute for Science and Public Affairs, 6003 Executive Blvd., Rockville, Maryland 20852.

When registering by phone or by letter, please state the Code Number shown below the title on the brochure.

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INSTITUTE FOR SCIENCE AND PUBLIC AFFAIRS

DESIGN of a DATA COMMUNICATIONS SYSTEM

CODE D 2 2 3

FOUR 3-DAY SEMINARS

December 3-5, 1975
San Francisco, California

January 14-16, 1976
Washington, D.C.

February 25-27, 1976
New York, New York

March 17-19, 1976
Washington, D.C.

presented by
THE INSTITUTE FOR
ADVANCED TECHNOLOGY

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This is a workshop/seminar for personnel involved in the design of a data communications system, who desire to increase their knowledge and capability in this advancing field. The course consists of lectures and workshops on intelligent terminals, distributed network design, distributed data base organization, packet switching, cost analysis, hardware/software trade-offs, support functions and automated technical control monitoring systems. Case studies and system projects will be provided. The course will enable the participant to define and design a data communications system using all of the currently available tools and cost-saving techniques.

WHO SHOULD ATTEND: System designers, analysts, programmers, and managers who wish to maximize investment for a total communications system. Personnel who are responsible for designing and supporting data communications systems.

WHAT WILL THE BENEFIT BE?

The attendee will learn in detail how to analyze the requirements of a data communications system, and how to collect the required information, perform an analysis on the input information and design a system requiring data staging, distributed data bases, packet switching, stand-alone message switching, front ending, data concentration and network configuration options.

COURSE OUTLINE

- I. INTRODUCTION
 - Course Details and Introductions
- II. SUB-SYSTEMS OF DATA COMMUNICATIONS
 - Terminals-Modems-Network-Central Site
- III. DEFINITION OF MAJOR TERMINOLOGY
 - A. Application
 - B. Data Protection
 - C. Data Validity
 - D. Data Recovery
 - E. Security & Privacy
 - F. Format/Routing
 - G. Queuing Mechanisms
 - H. Data Staging
 - I. Distributed Systems
- IV. TYPES OF DATA COMMUNICATION SYSTEMS
 - A. Message Switching
 - B. Front-Ending
 - C. Data Concentration FDM, TDM, Computer
 - D. Programmable Terminals
 - E. Packet Switching

- F. Distributed Data Bases
 - G. Memory Queuing
 - H. Disc Queuing
 - I. Distributed Data Bases/Processing Levels
- V. SYSTEMS ANALYSIS AND DESIGN REQUIREMENTS
- A. Areas of Investigation and Planning Steps for Design of a System
 - B. Establishing the System Requirement
 - C. Definition of the Points to be Connected
 - D. How to Develop and Use Traffic Information in Order to Develop a Functional Specification
 - E. How to Determine the Data Protection Requirements of the System
 - F. How to Analyze Response Time and Pick-up Time
 - G. How to Provide a System that Will Support Multiple Applications
 - H. Queuing Analysis
- VI. DATA COMMUNICATIONS LANGUAGE
- A. Code Sets
 - B. Control Codes
 - C. Control Messages
 - D. Message Formats
 - E. Line Protocols (SDLC)
- VII. COMPONENTS AND PERFORMANCE OF THE TRANSMISSION SUB-SYSTEM
- A. Terminal Types and Their Transmission Characteristics
 - B. Transmission Media Characteristics
 - C. Multiplexing and Data Concentrators
 - D. Microprogrammable Processors
 - E. Microprocessors
 - F. Data Staging Techniques
 - G. Satellite Transmission Considerations
 - H. Block Optimization Techniques
 - I. Data Compression Techniques
 - J. Forward Error Correction Techniques
 - K. Data Encryption Techniques
 - L. Data Blocks Chaining
- VIII. THE ANALYSIS AND FUNCTIONS OF DATA COMMUNICATIONS HARDWARE
- A. CPU: Microprogrammable
 - B. Disks/Tapes
 - C. Interrupt Structures
 - D. Multiplexers
 - E. Microprocessor Line Adapters
 - F. Technical Control Facilities
 - G. Hardware Configurations
 - H. Distributed Configurations
 - I. Automatic Recovery Considerations

- IX. DATA COMMUNICATIONS SOFTWARE
- A. Software Systems in Use
 - B. File Structures-Table Structures
 - C. Queuing Mechanisms
 - D. Line Protocols
 - E. Buffer File Management
 - F. Modularity
 - G. Audit and Privacy Considerations
 - H. Support Software
 - I. Address Routing
 - J. Block Optimization Techniques
- X. DISTRIBUTED NETWORK DESIGN
- A. Common Carrier Services and Tariffs
 - B. The Structures of Data Networks
 - C. Trade-offs in Designing a Data Network
 - D. Centralized-Decentralized Networks
 - E. Distributed Data Bases
 - F. Centralized Control Options
 - G. Design and Economics Problem Workshops
- XI. THE ANALYSIS OF A DISTRIBUTED NETWORK, DISTRIBUTED DATA BASE REQUIREMENT, PACKET NETWORK, DATA CONCENTRATOR, AND COMMUNICATIONS FRONT END SYSTEM
- A. Functional Requirements
 - B. Capacities and Throughput Analysis
 - C. Restart and Recovery
 - D. System Support Requirements
 - E. Trade-off Considerations
 - F. System Cost Analysis
 - G. Case Studies
 - H. Problem Workshop
- XII. SYSTEMS DOCUMENTATION
- A. Standards-Software-Hardware
 - B. Procedures and Operations
- XIII. IMPLEMENTING A DATA COMMUNICATIONS SYSTEM
- A. Support Personnel
 - B. Vendor Interface
 - C. Testing-Cutover
 - D. Support and Up-Grade
 - E. Costs
- XIV. COMMUNICATIONS COST-EFFECTIVENESS
- A. Analytical Models
 - B. Simulation
 - C. Evaluation of a System

The right to cancel the seminar or to amend the syllabus is reserved.
